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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/865,336	05/25/2001	Zane Drussel	15.0062 0103	3557

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EXAMINER

NORRIS, JEREMY C

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 03/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/865,336

Applicant(s)

DRUSSEL ET AL.

Examiner

Jeremy Norris

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-68 is/are pending in the application.
- 4a) Of the above claim(s) 63-68 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-28, 30-41, 43-52, 54-60 and 62 is/are rejected.
- 7) ☒ Claim(s) 29, 42, 53 and 61 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group II, claims 22-62 in Paper No. 6 is acknowledged.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 22-28, 30-41, 43-45, 47-52, 54-60, and 62 rejected under 35 U.S.C. 102(b) as being anticipated by US 5,448,451, granted to Takubo et al. (hereafter Takubo).

Takubo discloses, referring to figure 1, a circuit board substrate assembly comprising a substrate material (2) having first and second opposed edges, the substrate material comprising: a plurality of circuit forming regions (8-1) comprising at least one pair of adjacent circuit forming regions; a first interconnection region and a second interconnection region, wherein the first interconnection region extends along the first edge and is located between the first edge and the plurality of circuit forming regions, wherein the second interconnection region extends along the second edge and is located between the second edge and the plurality of circuit forming regions; and at least one opening (7-2) defined in the substrate material between each pair of adjacent circuit forming regions, wherein the at least one opening extends into at least portions of

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both the first interconnection region and second interconnection region [claim 22], wherein the substrate material further comprises a first end and a second end, wherein the plurality of circuit forming regions lie along a length of the substrate material between the first end and the second end, the length being defined along a longitudinal axis [claim 23], wherein both the first edge and second edge of the substrate material are substantially parallel to the longitudinal axis [claim 24], wherein the at least one opening comprises a first and second opposing end portion with the first end portion thereof lying along a first singulation axis of the substrate material parallel to the longitudinal axis and the second end portion of the at least one opening lying along a second singulation axis of the substrate material parallel to the longitudinal axis [claim 25], wherein the at least one opening is a single slot extending generally orthogonal to the longitudinal axis [claim 26], further comprising one or more circuits formed in the circuit forming regions of the substrate material resulting in a plurality of individual circuit board portions, wherein at least one of the plurality of individual circuit board portions has a length orthogonal to the longitudinal axis [claim 27], wherein the at least one opening has a length that is orthogonal to the longitudinal axis, and further wherein the length of the at least one opening is greater than the length of the at least one of the plurality of individual circuit board portions [claim 28], wherein the one or more circuits comprise surface mount component configurations [claim 30], wherein the at least one opening comprises a slot extending into at least portions of the first and second interconnection regions [claim 31], wherein the at least one opening between each pair of adjacent circuit forming regions is configured such that the plurality of circuit forming

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regions are separable by using a material removal tool operable to move along one or more parallel singulation axes to remove at least portions of the first and second interconnection regions [claim 32].

Additionally Takubo discloses, a circuit board substrate assembly comprising a substrate material (2), wherein the substrate material comprises a plurality of rows of circuit forming regions lying along a length of the substrate material, wherein each row comprises at least one pair of adjacent circuit forming regions (e.g. 8-1 for row 1, 8-2 for row 2), wherein a singulation axis is defined between each pair of adjacent rows, wherein at least one pair of adjacent circuit forming regions in at least one row is separated by at least one opening (7-2) defined in the substrate material that intersects with a singulation axis defined between the at least one row and an adjacent row, and that further intersects with a singulation axis defined between the at least one row and another adjacent row (see col. 9, lines 40-45) [claim 33], wherein the substrate material further comprises a plurality of columns of circuit forming regions [claim 34], wherein the substrate material further comprises: first and second opposed edges; and a first interconnection region and a second interconnection region, wherein the first interconnection region extends along the first edge and is located between the first edge and a first end row of the plurality of rows of circuit forming regions, wherein the second interconnection region extends along the second edge and is located between the second edge and a second end row of the plurality of rows of circuit forming regions, and further wherein one or more openings defined in the substrate material separating adjacent circuit forming regions in the first and second rows extend into at least one or

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more portions of the first interconnection region and second interconnection region, respectively [claim 35], wherein the plurality of rows of circuit forming regions lie along a length of the substrate material, the length being defined along a longitudinal axis [claim 36], wherein the substrate material further comprises a first edge and a second edge, wherein both the first edge and a second edge of the substrate material are substantially parallel to the longitudinal axis [claim 37], wherein the at least one opening has a first and second opposing end portion, the first end portion of each opening lying along a first singulation axis of the substrate material parallel to the longitudinal axis and the second end portion of the at least one opening lying along a second singulation axis of the substrate material parallel to the longitudinal axis [claim 38], wherein the at least one opening is a single slot extending generally perpendicular to the longitudinal axis [claim 39], further comprising one or more circuits formed in the adjacent circuit forming regions of the substrate material resulting in adjacent individual circuit board portions, wherein the adjacent individual circuit board portions have a length orthogonal to the longitudinal axis [claim 40]., wherein the at least one opening separating the adjacent individual circuit board portions has a length that is orthogonal to the longitudinal axis, and further wherein the length of the at least one opening is greater than the length of the adjacent individual circuit board portions [claim 41], wherein the one or more circuits comprise surface mount component configurations [claim 43], wherein the at least one opening comprises a slot orthogonal to the longitudinal axis [claim 44], wherein the at least one opening is configured such that the plurality of circuit forming regions are

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separable by using a material removal tool operable to move along one or more singulation axes [claim 45].

Moreover Takubo discloses a circuit board substrate assembly comprising: a substrate material (2) having a length defined along a longitudinal axis; a plurality of rows of circuit forming regions of the substrate material aligned parallel to the longitudinal axis; one or more circuits (8-1, 8-2) formed in the circuit forming regions resulting in rows of individual circuit portions lying along the length of the substrate material parallel to the longitudinal axis, wherein each individual circuit portion comprises a first end portion and a second end portion, and further wherein each individual circuit portion in a row is separated from each adjacent individual circuit portion in the row by an opening (7-2); a plurality of interconnection regions extending along the length of the substrate material parallel to the longitudinal axis, wherein the first and second end portions of each individual circuit portion are adjacent to an interconnection region; and a singulation axis defined along the length of the substrate material within each of the plurality of interconnection regions, wherein each singulation axis is parallel to the longitudinal axis, wherein the opening separating each individual circuit portion in a row from each adjacent circuit portion in the row extends into an interconnection region adjacent the first end portion of the individual circuit portion and intersects with a singulation axis lying within such interconnection region, and further wherein such opening extends into an interconnection region adjacent the second end portion of the individual circuit portion and intersects a singulation axis lying within such interconnection region [claim 47], wherein the opening is a single slot extending

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generally orthogonal to the longitudinal axis [claim 48], wherein at least one of the individual circuit board portions has a length orthogonal to the longitudinal axis extending between the first end portion and second end portion thereof [claim 49], wherein the opening has a length that is orthogonal to the longitudinal axis, and further wherein the length of the opening is greater than the length of the at least one individual circuit board portion [claim 50], wherein the opening comprises a slot [claim 51], wherein the opening is configured such that the individual circuit board portions are separable by using a material removal tool operable to move along one or more of the singulation axes defined along the length of the substrate material [claim 52], wherein one or more of the individual circuit portions comprise surface mount component configurations [claim 54].

In addition, Takubo discloses, a circuit board substrate assembly comprising: a substrate material (2) having a length defined along a longitudinal axis; a plurality of rows of circuit forming regions of the substrate material aligned parallel to the longitudinal axis; one or more circuits (8-1, 8-2) formed in the circuit forming regions resulting in a plurality of rows of individual circuit portions lying along the length of the substrate material parallel to the longitudinal axis, wherein each individual circuit portion in a row is separated from each adjacent individual circuit portion in the row by an opening (7-2); at least one row of the plurality of rows of individual circuit portions being adjacent a first interconnection region and a second interconnection region, wherein the first interconnection region and the second interconnection region lie along the length of the substrate material parallel to the longitudinal axis, wherein the first interconnection

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region is located between the at least one row of individual circuit portions and an adjacent row of individual circuit portions, and further wherein the second interconnection region is located between the at least one row of individual circuit portions and another adjacent row of individual circuit portions; and a first singulation axis and a second singulation axis, wherein the first singulation axis and the second singulation axis lie along the length of the substrate material parallel to the longitudinal axis, wherein the first singulation axis is defined in the first interconnection region, wherein the second singulation axis is defined in the second interconnection region, wherein the opening separating each individual circuit portion of the at least one row from each adjacent circuit portions in the at least one row extends into the first interconnection region and the second interconnection region, and further wherein the opening intersects the first singulation axis and the second singulation axis [claim 55], wherein the opening is a single slot extending generally orthogonal to the longitudinal axis [claim 56], wherein at least one of the individual circuit portions has a length orthogonal to the longitudinal axis [claim 57], wherein the opening has a length that is orthogonal to the longitudinal axis, and further wherein the length of the opening is greater than the length of the at least one individual circuit portion claim 58], wherein the opening comprises a slot [claim 59], wherein the opening is configured such that the individual circuit portions are separable by using a material removal tool operable to move along one or more of the singulation axes [claim 60], wherein one or more of the individual circuit portions comprise surface mount component configurations [claim 62].

Claim Rejections - 35 USC § 102/103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 46 is rejected under 35 U.S.C. 102(b) as anticipated by Takubo or, in the alternative, under 35 U.S.C. 103(a) as obvious over Takubo in view of US 5,311,407, granted to Lombard (hereafter Lombard).

Takubo discloses the claimed invention as described above except that Takubo does not specifically state that the material removal tool comprises a routing tool. However, this is a process limitation in a product claim and cannot serve to patentably define the product over the prior art of Takubo (see MPEP 2113). Moreover, it is well settled that the presence of process limitations in product claims, which product does not otherwise distinguish over the prior art, cannot impart patentability to that product.

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(*In re Thorpe*, 227 USPQ 964, 966). Furthermore, Lumbard teaches using a routing tool as the tool for simulating a TAB device (see col. 5, lines 59-65). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to use a routing tool to singulate the device of Takubo, as taught by, Lumbard. The motivation for doing so would have been to utilize a well known process.

Allowable Subject Matter

Claims 29, 42, 53, and 61 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 29 and 42 state the limitation "wherein the one or more circuits comprise ball grid array configurations." This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art.

Similarly, claims 53 and 61 state the limitation "wherein one or more of the individual circuit portions comprise ball grid array configurations". This limitation, in conjunction with the other claimed limitations was also neither found to be disclosed in, nor suggested by the prior art.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 5,521,430 Shibata,

US 5,854,741 Shim et al.,

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US 6,246,015 Kim,


US 6,342,727 Fujimori.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy Norris whose telephone number is 703-306-5737. The examiner can normally be reached on Mon.-Th., 9AM - 6:30 PM and alt. Fri. 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7724 for regular communications and 703-305-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JCSN
March 22, 2002



K. L. Norris
Primary Examiner